

AMENDMENTS TO THE CLAIMS

Claim 1. (Currently Amended) A data architecture of map data stored in a computer readable medium comprising:

link identification information identifying a plurality of original links, each of the original links represents a part of a road constituting an actual road network, the original links extending between a first node and a second node; and

auxiliary link identification information used for identifying a plurality of alternative links each of the plurality of alternative links replacing at least part of one of the plurality of original links in the map data, and extending between a third node and one of said first node or second node.

wherein the link identification information for each original link replaced by the alternative links is associated with the auxiliary link identification information for the alternative links, whereby a map data processing apparatus recognizes a relationship between the original link and the alternative links.

Claim 2. (Currently Amended) A data architecture of map data stored in a computer readable medium comprising a plurality of data parts processed by a map data processing apparatus for different purposes, wherein each of the data part parts includes the data architecture according to claim 1.

Claim 3. (Previously Presented) A method of designating instructions to a map data processing apparatus for updating map data having the data architecture according to claim 1, comprising:

providing update-operation information for causing the map data processing apparatus to add new data items to the map data, the new data items concerning alternative links which substitute for any of original links in the map data,

wherein the update-operation information concerning each alternative link includes link identification information identifying the original link replaced by the alternative links, and auxiliary link identification information identifying the alternative links.

Claim 4. (Currently Amended) A map data processing apparatus comprising:

a storage unit for storing map data, the map data including a data architecture of map data stored in a computer readable medium comprising:

link identification information identifying a plurality of original links, each of the original links represents a part of a road constituting an actual road network, the original links extending between a first node and a second node; and

auxiliary link identification information used for identifying a plurality of alternative links each of the plurality of alternative links replacing at least part of one of the plurality of original links in the map data, and extending between a third node and one of said first node or second node.

wherein the link identification information for each original link replaced by the alternative links is associated with the auxiliary link identification information for the alternative links, whereby a map data processing apparatus recognizes a relationship between the original link and the alternative links;

a receiving unit for receiving update instruction data and designating instructions to the map data processing apparatus for updating the map data, the instructions includes ~~including providing~~ update-operation information for causing the map data processing apparatus to add new data items to the map data, the new data items concerning alternative links which substitute for any of original links in the map data,

wherein the update-operation information concerning each alternative link includes link identification information identifying the original link replaced by the alternative links, and auxiliary link identification information identifying the alternative links; and

an update processor for updating the map data in accordance with the update instruction data.

Claim 5. (Withdrawn) A data architecture of map data comprising:

a plurality of node/link data items designating a plurality of links, respectively, each of links corresponding to a part of a road constituting an actual road network,

each node/link data item including: link identification information identifying the corresponding link; link validity information identifying whether the corresponding link is valid

or invalid; and interconnection information for indicating interconnections between the corresponding link and other links,

wherein when the corresponding link is an original link replaced by a plurality of alternative links in the map data, the link validity information identifies that the corresponding link is invalid, and the interconnection information indicates that the original link is associated with the alternative links, whereby a map data processing apparatus can recognize relationship between the original link and the alternative links.

Claim 6. (Withdrawn) A data architecture of update instruction data designating instructions to a map data processing apparatus for updating map data having the data architecture according to claim 5, comprising:

first update-operation information for causing the map data processing apparatus to modify the node/link data item corresponding to the original link; and

second update-operation information for causing the map data processing apparatus to add new node/link data items to the map data, the new node/link data items concerning alternative links which substitute for any of original links in the map data,

wherein the first update-operation information designating an instruction to rewrite the corresponding link validity information so that the link validity information identifies that the corresponding original link is invalid, and another instruction to rewrite the corresponding interconnection information indicates that the corresponding original link is associated with the alternative links, and wherein the second update-operation information causing the

corresponding new node/link data items include link validity information identifying that the corresponding alternative links are valid, and interconnection information indicating that the corresponding alternative links are associated with the original link.

Claim 7. (Withdrawn) A map data processing apparatus comprising:

a storage unit for storing map data having the data architecture according to claim 5;

a receiving unit for receiving update instruction data having the data architecture according to claim 6 and designating instructions to the map data processing apparatus for updating the map data; and

an update processor for updating the map data in accordance with the update instruction data.

Claim 8. (Previously Presented) A map data providing apparatus comprising an update instruction data storage storing update instruction data having the architecture according to claim 3, and designating instructions to a map data processing apparatus for updating map data, and

a transmitter for sending the update instruction data to the map data processing apparatus.